Early Chinese Rice.

AN unusually detailed account of the discovery and utilisation of a 'sport' occurs on page 470 of the 1859 edition of an English translation of "The Chinese Empire," by Monsieur Huc. The account may be of interest to agriculturists and geneticists. The book is not often met with, and indeed I have had no opportunity of consulting the French original.

"'I was walking, says the Emperor Khang-hi, 'on the first day of the sixth moon, in some fields where rice was sown, which was not expected to yield its harvest until the ninth. I happened to notice a rice plant that had already come into ear; it rose above all the rest, and was already ripe. I had it gathered and brought to me; the grain was very fine and full, and I was induced to keep it for an experiment, and see whether it would on the following year retain this precocity, and in fact it did. All the plants that proceeded from it came into ear before the ordinary time, and yielded their harvest in the sixth moon. Every year has multiplied the produce of the preceding, and now for thirty years it has been the rice served on my table. The grain is long, and of a rather reddish colour, but of a sweet perfume, and very pleasant flavour. It has been named *ya-mi*, or 'Imperial rice', because it was in my gardens that it was first cultivated. It is the only kind that can ripen north of the Great Wall, where the cold begins very early, and ends very late, but in the provinces of the south, where the climate is milder, and the soil more fertile, it is easy to obtain two harvests a-year from it. . . .'"

M. Huc adds that this rice was introduced into Manchuria, and that it succeeds admirably in dry countries, having no need of perpetual irrigation. He thought it would certainly prosper in France, but although he sent several samples to that country he never heard that any experiment was tried with it.

Two French books allude somewhat vaguely to this rice. "Le Rapport sur les Cereales: Exposition Universelle" (Paris, 1878), mentions the above story and offers the alternative name *riz précoce*. "Les Plantes de grande culture" (Paris, 1893) says that there appears to be a variety of rice in China which completes its growth in less than three months.

The variety is probably identical with the *yu-mi* (*Oryza communis pyrocarpa* Al.) which is the only variety specifically attributed to China by M. A. Carleton ("The Small Grains"; New York, 1916).

The emperor Khang-hi reigned from 1662 until 1723.

HUGH NICOL.

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Raman Spectra of Crystalline Nitrates.

IN a communication to NATURE of Mar. 22, p. 463, P. Krishnamurti describes some results of his experiments with powdered crystals. In a paper sent two weeks ago to the *Annalen der Physik* I have given the results of my measurements on much the same subject. By suspending the crystal powder in a liquid of suitable refractive index, and using suitable light filters, I obtained the Raman spectrum of such intensity that a spectrograph with large dispersion and very narrow slit could be employed.

Like Krishnamurti, I found a displacement of the inactive NO_3 frequency depending on the kation, and also a new remarkable difference between the anhydrous crystals and the hydrates. The frequency differences of the inactive Raman frequency of the NO_3 ion are as follows: (1) monovalent salts: lithium (anh.), 1086; lithium (hydr. $\frac{1}{2}$ H_2O), 1073; lithium (hydr. 3 H_2O), 1055·5; sodium (anh.), 1067·5; potassium (anh.), 1048 4; silver (anh.), 1045·0. (2) bivalent salts: calcium (anh.), 1064·3; calcium (hydr. $4H_2O$), 1044·6; strontium (anh.), 1054·4; copper (hydr. $6H_2O$), 1052·9; copper (hydr. $9H_2O$), 1044·4; barium (anh.), 1046·5; lead (anh.), 1045·0.

Some of the wave numbers are in accordance with the data given by Krishnamurti.

Furthermore, in solutions of the nitrates, I found a variation of the NO_3 frequency with the concentration; for example, for a solution of 10 mol $NaNO_3$ in a litre of water $\Delta\nu = 1049{\cdot}8$, and for a 3 mol solution $\Delta\nu = 1047{\cdot}2$. For a 14 mol solution of $LiNO_3$ the Raman difference was $\Delta\nu = 1050{\cdot}3$; for a 0·5 mol solution $\Delta\nu = 1046{\cdot}0$.

WALTHER GERLACH.

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Effect of Direct Current on the Frequency of Sonometer Wire.

THE maintenance of oscillations of a sonometer wire by the passage of an alternating current through it has been studied in detail by Krishnaiyer and others (*Phil. Mag.*, 1922, etc.). If, however, direct current of the value of about an ampere be passed through the wire, it is found that the frequency of the oscillations, for a fixed position of the two sonometer bridges, is slightly lower than what it is when no current is passing. This effect is best observed by tuning the sonometer with an electrically excited fork placed on the sonometer board. When the wire is tuned to this frequency it begins to vibrate with a large amplitude. These vibrations are observed with a low power microscope. If the direct current be now passed through the wire, the amplitude of the vibrations is immediately reduced, and can be restored again to its original strength by shortening a little the length of the wire between the bridges.

We have verified that this lowering in frequency is not due to the heating effect of the current and is also not a magnetic effect. This effect can also be observed with an ordinary tuning fork and wires of any material.

The quantitative measurements and other interesting results will be published elsewhere.

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Band Spectra of Copper Oxide.

EDER and Valenta in 1911 had observed some of the bands of copper oxide in the flame spectra of all copper salts. Hertenstein observed them in the flame of the arc in air in 1912. R. S. Mulliken (*Phys. Rev.*, **26**, 4; 1925) also noticed them while working on the spectrum of CuI as excited by active nitrogen. They would appear better by a small leakage of air into the halide vapour, or the presence of a little oxygen in the nitrogen used. I have obtained these bands by arcing between copper electrodes in an atmosphere of oxygen. They are degraded towards the red and occur in pairs, of which the shorter wave-length component is relatively weak. Their rotational structure reveals that the system is due probably to a $^2\Sigma \rightarrow {}^2\Sigma$ transition. The frequencies of vibration for infinitesimal amplitude are found to be approximately 620 cm.$^{-1}$ and 345 cm.$^{-1}$ for the final and initial states respectively. A detailed investigation will be published elsewhere.

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